SRI LANKA STANDARD
NA to SLS EN 1992-1-1:2013

SRI LANKA NATIONAL ANNEX TO
EUROCODE 2: DESIGN OF CONCRETE STRUCTURES —
PART 1-1: GENERAL RULES AND RULES FOR BUILDINGS

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NATIONAL ANNEX TO SLS EN 1992-1-1:2013,
EUROCODE 2: DESIGN OF CONCRETE STRUCTURES —
PART 1-1: GENERAL RULES AND RULES FOR BUILDINGS

INTRODUCTION

This National Annex has been prepared by the Working group on the development of the National Annexes to Euro Codes (SC35/WG/12), structural use of concrete. It is to be used in conjunction with **SLS EN 1992-1-1:2012.**

This National Annex was approved by the Sectoral Committee on Building and Construction Materials and was authorized for adoption and publication as a Sri Lanka National Annex by the Council of the Sri Lanka Standards Institution on 2013-10-02.

NA.1 SCOPE

This National Annex gives Sri Lanka decisions for the Nationally Determined Parameters described in the following sub clauses of **SLS EN 1992-1-1:2012:**

— 2.3.3 (3)	**— 4.4.1.3 (4)**	**— 6.4.3 (6)**	**— 9.2.1.3 (1)**	**— 11.3.5 (1)P**
— 2.4.2.1 (1)	**— 5.1.3 (1)P**	**— 6.4.4 (1)**	**— 9.2.1.4 (1)**	**— 11.3.5 (2)P**
— 2.4.2.2 (1)	**— 5.2 (5)**	**— 6.4.5 (3)**	**— 9.2.2 (4)**	**— 11.3.7 (1)**
— 2.4.2.2 (2)	**— 5.5 (4)**	**— 6.4.5 (4)**	**— 9.2.2 (5)**	**— 11.6.1 (1)**
— 2.4.2.2 (3)	**— 5.6.3 (4)**	**— 6.5.2 (2)**	**— 9.2.2 (6)**	**— 11.6.1 (2)**
— 2.4.2.3 (1)	**— 5.8.3.1 (1)**	**— 6.5.4 (4)**	**— 9.2.2 (7)**	**— 11.6.2 (1)**
— 2.4.2.4 (1)	**— 5.8.3.3 (1)**	**— 6.5.4 (6)**	**— 9.2.2 (8)**	**— 11.6.4.1 (1)**
— 2.4.2.4 (2)	**— 5.8.3.3 (2)**	**— 6.8.4 (1)**	**— 9.3.1.1 (3)**	**— 12.3.1 (1)**
— 2.4.2.5 (2)	**— 5.8.5 (1)**	**— 6.8.4 (5)**	**— 9.5.2 (1)**	**— 12.6.3 (2)**
— 3.1.2 (2)P	**— 5.8.6 (3)**	**— 6.8.6 (1)**	**— 9.5.2 (2)**	**— A.2.1 (1)**
— 3.1.2 (4)	**— 5.10.1 (6)**	**— 6.8.6 (3)**	**— 9.5.2 (3)**	**— A.2.1 (2)**
— 3.1.6 (1)P	**— 5.10.2.1 (1)P**	**— 6.8.7 (1)**	**— 9.5.3 (3)**	**— A.2.2 (1)**
— 3.1.6 (2)P	**— 5.10.2.1 (2)**	**— 7.2 (2)**	**— 9.6.2 (1)**	**— A.2.2 (2)**
— 3.2.2 (3)P	**— 5.10.2.2 (4)**	**— 7.2 (3)**	**— 9.6.3 (1)**	**— A.2.3 (1)**
— 3.2.7 (2)	**— 5.10.2.2 (5)**	**— 7.2 (5)**	**— 9.7 (1)**	**— C.1 (1)**
— 3.3.4 (5)	**— 5.10.3 (2)**	**— 7.3.1 (5)**	**— 9.8.1 (3)**	**— C.1 (3)Note 1**
— 3.3.6 (7)	**— 5.10.8 (2)**	**— 7.3.2 (4)**	**— 9.8.2.1 (1)**	**— C.1 (3)Note 2**
— 4.4.1.2 (3)	**— 5.10.8 (3)**	**— 7.3.4 (3)**	**— 9.8.3 (1)**	**— E.1 (2)**
— 4.4.1.2 (5)	**— 5.10.9 (1)P**	**— 7.4.2 (2)**	**— 9.8.3 (2)**	**— J.1 (3)**
— 4.4.1.2 (6)	**— 6.2.2 (1)**	**— 8.2 (2)**	**— 9.8.4 (1)**	**— J.2.2 (2)**
— 4.4.1.2 (7)	**— 6.2.2 (6)**	**— 8.3 (2)**	**— 9.8.5 (3)**	**— J.3 (2)**
— 4.4.1.2 (8)	**— 6.2.3 (2)**	**— 8.6 (2)**	**— 9.10.2.2 (2)**	**— J.3 (3)**
— 4.4.1.2 (13)	**— 6.2.3 (3)**	**— 8.8 (1)**	**— 9.10.2.3 (3)**	
— 4.4.1.3 (1)P	**— 6.2.4 (4)**	**— 9.2.1.1 (1)**	**— 9.10.2.3 (4)**	
— 4.4.1.3 (3)	**— 6.2.4 (6)**	**— 9.2.1.1 (3)**	**— 9.10.2.4 (2)**	

NA.2 NATIONALLY DETERMINED PARAMETERS

Sri Lanka decisions for the nationally determined parameters described in **SLS EN 1992-1-1:2012** are given in **Table NA.1.**

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TABLE NA.1 – Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012

Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
2.3.3 (3)	Value of d_{cont}	30 m	50 m
2.4.2.1 (1)	Partial factor for shrinkage action γ_{SH}	1.0	Use the recommended value
2.4.2.2 (1)	Partial factor for prestress $\gamma_{P,fav}$	1.0	Use the recommended value
2.4.2.2 (2)	Partial factor for prestress $\gamma_{P,unfav}$	1.3	Use the recommended value
2.4.2.2 (3)	Partial factor for prestress $\gamma_{P,unfav}$ for local effects	1.2	Use the recommended value
2.4.2.3 (1)	Partial factor for fatigue loads $\gamma_{F,fat}$	1.0	Use the recommended value
2.4.2.4 (1)	Partial factors for materials for ultimate limit states γ_C and γ_S	Table 2.1N	Use the recommended value
2.4.2.4 (2)	Partial factors for materials for serviceability limit states γ_C and γ_S	1.0	Use the recommended value
2.4.2.5 (2)	Value of k_f	1.1	Use the recommended value
3.1.2 (2) P	Value of C_{max}	C90/105	Use the recommended value. However, the shear strength of concrete classes higher than C50/60 should be determined by tests, unless there is evidence of satisfactory past performance of the particular mix including the type of aggregates used. Alternatively, shear strength of concrete strength classes higher than C50/60 may be limited to that of C50/60.
3.1.2 (4)	Value of k_t	0.85	Use the recommended value
3.1.6 (1) P	Value of α_{cc}	1.0	0.85(for all phenomena)
3.1.6 (2) P	Value of α_{ct}	1.0	Use the recommended value
3.2.2 (3) P	Upper limit of f_{yk}	600 MPa	500 MPa
3.2.7 (2)	Design assumptions for reinforcement : value of ε_{ud}	$0.9\varepsilon_{uk}$	Use the recommended value
3.3.4 (5)	Value of k	1.1	Use the recommended value
3.3.6 (7)	Design assumptions for prestressing tendons: value of ε_{ud}	$0.9\varepsilon_{uk}$ or if more accurate values are not known: ε_{ud} =0.02 $f_{p0.1k}/f_{pk}$= 0.9	Use the recommended values

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TABLE NA.1 – Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012(continued)

Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
4.4.1.2 (3)	Value of $c_{min.b}$	Post-tensioned bonded tendons in rectangular ducts: greater of the smaller dimension or half the greater dimension. Post –tensioned bonded tendons in circular ducts:diameter. Pre-tensioned tendons: 1.5 x diameter of strand or plain wire, 2.5 x diameter of indented wire.	Use the recommended values
4.4.1.2 (5)	Structural classification and values of minimum cover due to environmental conditions $C_{min,dur}$	Table 4.3 N for structural classification Tables 4.4 N and 4.5 N for values of $c_{min.dur}$	Use the recommended values
4.4.1.2 (6)	Value of $\Delta c_{dur,\gamma}$	0 mm	Use the recommended value
4.4.1.2 (7)	Value of $\Delta c_{dur,st}$	0 mm	Use the recommended value
4.4.1.2 (8)	Value of $\Delta c_{dur,add}$	0 mm	Use the recommended value
4.4.1.2 (13)	Value of k_1, k_2, k_3	k_1 = 5 mm k_2 = 10 mm k_3 = 15 mm	Use the recommended values
4.4.1.3 (1)P	Value of Δc_{dev}	10 mm	Use the recommended value
4.4.1.3 (3)	Value of Δc_{dev} under controlled conditions	Expressions (4.3 N) and (4.4 N)	Use the recommended values
4.4.1.3 (4)	Values of k_1 and k_2	k_1 = 40 mm k_2 = 75 mm	Use the recommended value

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TABLE NA.1 – Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
5.1.3 (1) P	Simplified load arrangements	The following load arrangements should be considered a) alternate spans carrying the design variable and permanent load ($\gamma_Q Q_k + \gamma_G G_k + P_m$), other spans carrying only the design permanent load $\gamma_G G_k + P_m$; b) any two adjacent spans carrying the design variable and permanent loads ($\gamma_Q Q_k + \gamma_G G_k + P_m$; all other spans carrying only the design permanent load, $\gamma_G G_k + P_m$	Use any of the following three options. a) Consider the two load arrangements recommended in the Eurocode for alternate and adjacent spans. b) Consider the two following arrangements for all spans and alternate spans: 1) all spans carrying the design variable and permanent load ($\gamma_Q Q_k + \gamma_G G_k + P_m$), 2) alternate spans carrying the design variable and permanent load ($\gamma_Q Q_k + \gamma_G G_k + P_m$), other spans carrying only the design permanent load $\gamma_G G_k + P_m$; the same value of γ_G should be used throughout the structure; c) For slabs, use the all spans loaded arrangement described in b)1) if: 1) in a one-way spanning slab the area of each bay exceeds 30 m^2; 2) the ratio of the variable load Q_k to the permanent load G_k does not exceed 1,25; and 3) the variable load Q_k does not exceed 5 kN/m^2 excluding partitions. When analysis is carried out using the load arrangement described in b)1), the resulting support moments except those at the supports of cantilevers should be reduced by 20 %, with a consequential increase in the span moments. In this context a bay means a strip across the full width of a structure bounded on the other two sides by lines of support.
5.2(5)	Value of θ_o	1/200	Use the recommended value

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TABLE NA.1 – Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
5.5 (4)	Moment redistribution formula: values of k_1, k_2, k_3, k_4, k_5 and k_6	$k_1 = 0.44$ $k_2 = 1.25(0.6 + 0.0014/\varepsilon_{cu2})$ $k_3 = 0.54$ $k_4 = 1.25\ (0.6 + 0.0014/\varepsilon_{cu2})$ $k_5 = 0.7$ $k_6 = 0.8$	For steels with $f_{yk} \leq 500$ MPa $k_1 = k_3 = 0.4$ $k_2 = k_4 = 0.6 + 0.001\ 4/\varepsilon_{cu2}$ $k_5 = 0.7$ $k_6 = 0.8$ For steels with $f_{yk} > 500$ MPa, more restrictive values than those given for steels with $f_{yk} \leq 500$ MPa may have to be used.
5.6.3 (4)	Values of $\theta_{pl,d}$	Figure 5.6 N	Use the recommended values
5.8.3.1 (1)	Values of λ_{lim}	$\lambda_{lim} = 20 \cdot A \cdot B \cdot C/(\sqrt{n})$	Use the recommended value
5.8.3.3 (1)	Values of k_1	0.31	Use the recommended value
5.8.3.3 (2)	Value of k_2	0.62	Use the recommended value
5.8.5 (1)	Methods of second order analysis	Choice of the following two simplified methods: a) Methods based on nominal stiffness b) Method based on nominal curvature	Use either method
5.8.6 (3)	Value of γ_{cE}	1.2	Use the recommended value
5.10.1 (6)	Methods of avoid brittle failure of prestressed members	Methods A to E	Any of the methods A to E
5.10.2.1 (1)P	Maximum stressing force: values of k_1 and k_2	$k_1 = 0.8$ $k_2 = 0.9$	Use the recommended values
5.10.2.1 (2)	Maximum stressing force; value of k_3	0.95	Use the recommended value
5.10.2.2 (4)	Minimum strength of concrete at various stages of prestressing : values of k_4 and k_5	$k_4 = 50$ % $k_5 = 30$ %	Use the recommended values

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TABLE NA.1 – Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012(continued)

Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
5.10.2.2 (5)	Increase of stress at time of transfer of prestress:value of k_6	$k_6 = 0.7$	Use the recommended value
5.10.3 (2)	Prestressing force immediately after tensioning : values of k_7 and k_8	$k_7 = 0.75$ $k_8 = 0.85$	Use the recommended values
5.10.8 (2)	Value of $\Delta_{\sigma p,ULS}$	100 MPa	Use the recommended value
5.10.8 (3)	Values of $\gamma_{\Delta P,sup}$ and $\gamma_{\Delta P,inf}$	$\gamma_{\Delta P,sup} = 1.2$ $\gamma_{\Delta P,inf} = 0.8$ Both values taken as 1.0 if linear analysis with uncracked sections is applied	Use the recommended values
5.10.9 (1)P	Values of r_{sup} and r_{inf}	For pre-tensioning, unbounded tendons: $r_{sup} = 1.05$ and $r_{inf} = 0.95$ For post-tensioning, bonded tendons : $r_{sup} = 1.10$ and $r_{inf} = 0.90$ When appropriate measures (e.g. direct measurements of pretensioning) are taken $r_{sup} = 1.0$ anmd $r_{inf} = 1.0$	Use the recommended values
6.2.2 (1)	Values of $C_{Rd,c}$, v_{min} and k_1 for normal shear	$C_{Rd,c} = 0.18/\gamma_c$ $v_{min} = 0.035\ k^{3/2} f_{ck}^{1/2}$ $k_1 = 0.15$	Use the recommended values
6.2.2 (6)	Value of v	$v = 0.6(1\text{-}f_{ck}/250)$	Use the recommended value
6.2.3 (2)	Limiting values of cotθ	$1 \leq \cot\theta \leq 2.5$	$1 \leq \cot\theta \leq 2.5$, except in elements in which shear co-exists with externally applied tension (i.e. tension caused by restraint is not considered here). In these elements, cotθ should be taken as 1.0.

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TABLE NA.1 – Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
6.2.3 (3)	Values of v_1 and α_{cw}	$v_1 = v$ as described by Expression (6.3N) or takes the values given in Expressions (6.10.aN) and (6.10.bN) α_{cw} takes the values given in Expressions (6.11 aN), (6.11.bN) and (6.11 cN)	Use the recommended values
6.2.4 (4)	Range of values of $\cot\theta_f$	$1.0 \leq \cot\theta_f \leq 2.0$ for compression flanges $1.0 \leq \cot\theta_f \leq 1.25$ for tension flanges	Use the recommended value
6.2.4 (6)	Value of k	0.4	Use the recommended value
6.4.3 (6)	Values of β	$\beta = 1.5$ for a corner column $\beta = 1.4$ for an edge column $\beta = 1.15$ for an internal column	Use the recommended values
6.4.4 (1)	Values of $C_{Rd,c}$, v_{min} and k_1 for punching shear	$C_{Rd,c} = 0.18/\gamma_c$ $v_{min} = 0.035\ k^{3/2} f_{ck}^{1/2}$ $k_1 = 0.1$	Use the recommended values (refer also to 3.1.2 (2)P for a requirement for concrete class > C50/60)
6.4.5 (3)	The value of maximum punching resistance adjacent to column $V_{Rd,max}$	$V_{Rd,max} = 0.5 v f_{cd}$	Use the recommended value
6.4.5 (4)	The distance kd of the outer perimeter of punching shear reinforcement from the perimeter U_{out}	$k = 1.5$	$k = 1.5$ unless the perimeter at which the reinforcement is no longer required is less than 3d from the face of the loaded area/column. In this case the reinforcement should be placed in the zone $0.3d$ and $1.5d$ from the face of the column.
6.5.2 (2)	Value of v'	$v' = 1 - f_{ck}/250$	Use the recommended value
6.5.4 (4)	Value of k_1, k_2, k_3	$k_1 = 1.0$ $k_2 = 0.85$ $k_3 = 0.75$	Use the recommended values
6.5.4 (6)	Value of k_4	$k_4 = 3.0$	Use the recommended value

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Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
6.8.4 (1)	Values of $\gamma_{F,fat}$ and parameters for S-N curves	$\gamma_{F,fat} = 1.0$ Values of parameters for S-N curves for reinforcing steels given in Table 6.3N Values of parameters for S-N curves for prestressing steels given in Table 6.4N	Use the recommended values
6.8.4 (5)	Value of k_2	5	Use the recommended value
6.8.6 (1)	Values of k_1 and k_2	$k_1 = 70$ MPa $k_2 = 35$ MPa	Use the recommended values
6.8.6 (3)	Value of k_3	0.9	Use the recommended value
6.8.7 (1)	Fatigue: values for N and k_1	$N = 10^6$ cycles $k_1 = 0.85$	Use the recommended values
7.2 (2)	Value of k_1	0.6	Use the recommended value
7.2 (3)	Value of k_2	0.45	Use the recommended value
7.2 (5)	Value of k_3, k_4, k_5	$k_3 = 0.8$ $k_4 = 1.0$ $k_5 = 0.75$	Use the recommended values
7.3.1 (5)	Limitations of crack width w_{max}	Table 7.1N	Use Table NA.2
7.3.2 (4)	Value of $\sigma_{ct,p}$	$f_{ct,eff}$ in accordance with 7.3.2 (2)	Use the recommended value
7.3.4 (3)	Maximum crack spacing in Expression (7.11): values for k_3 and k_4	$k_3 = 3.4$ $k_4 = 0.425$	Use the recommended values
7.4.2 (2)	Values of basic span/depth ratios	Table 7.4N	Use Table NA.3
8.2 (2)	Values of k_1 and k_2	$k_1 = 1$ mm $k_2 = 5$ mm	Use the recommended values
8.3 (2)	Minimum mandrel diameter $ø_{m,min}$	Table 8.1N	Use the recommended table in Eurocode (Table 8.1N)

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TABLE NA.1 – Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012(continued)

Sub clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka Decision
8.6 (2)	Anchorage capacity of a welded bar	$F_{btd} = l_{td}\varnothing_t\sigma_{td} \leq F_{wd}$	Use the recommended value
8.8 (1)	Additional rules for large diameter bars: limiting bar size	$\varnothing_{large} > 32$ mm	Use the recommended value
9.2.1.1 (1)	Beams: minimum reinforcement areas	$A_{s,min} = 0.26(f_{ctm}/f_{yk})b_t d \geq 0.001\,3 b_t d$	Use the recommended value
9.2.1.1 (3)	Beams: maximum reinforcement areas	$A_{s,max} = 0.04A_c$	Use the recommended value
9.2.1.3 (1)	Beams: minimum ratio of span bending moment to be assumed at supports in monolithic construction	$\beta_1 = 0.15$	$\beta_1 = 0.3$
9.2.1.4 (1)	Anchorage of bottom reinforcement at an end support: area of steel provided over supports with little or no end fixity in design	$\beta_2 = 0.25$	$\beta_1 = 0.3$
9.2.2 (4)	Minimum ratio of shear reinforcement in the form of links	$\beta_3 = 0.5$	Use the recommended value
9.2.2 (5)	Minimum shear reinforcement	$\rho_{w,min} = (0.08\sqrt{f_{ck}})/f_{yk}$	Use the recommended value
9.2.2 (6)	Maximum longitudinal spacing of shear assemblies	$s_{l,max} = 0.75d(1 + \cot\alpha)$	Use the recommended value
9.2.2 (7)	Maximum longitudinal spacing of bent-up bars	$s_{b,max} = 0.6d\,(1 + \cot\alpha)$	Use the recommended value

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TABLE NA.1 — Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub-clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka decision
9.2.2 (8)	Maximum transverse spacing of links	$s_{t,max} = 0.75d \leq 600$ mm	The spacing of links in the direction of the span should not exceed $0.75d$. At right-angles to the span, the horizontal spacing should be such that no longitudinal tension bar is more than 150 mm from a vertical leg and maximum distance between vertical legs should be ≤ 400 mm; this spacing should in any case not exceed d.
9.3.1.1 (3)	Value of $s_{max,slabs}$	For principal reinforcement: 3h ≤ 400 mm For secondary reinforcement: 3.5h ≤ 450 mm Except in areas with concentrated loads or maximum moment where: For principal reinforcement: 2h ≤ 250 mm For secondary reinforcement: 3h ≤ 400 mm	Value for principal reinforcement shall be 3h subject to a maximum of 300 mm Value for secondary reinforcement shall be 3.5h subject to a maximum of 300 mm Except in areas with concentrated loads or maximum moment where: Value for principal reinforcement shall be 2h subject to a maximum of 250 mm Value for secondary reinforcement shall be 3h subject to a maximum of 350 mm
9.5.2 (1)	Minimum diameter of longitudinal reinforcement in columns	$\varnothing_{min} = 8$ mm	$\varnothing_{min} = 12$ mm
9.5.2 (2)	Minimum area of longitudinal reinforcement in columns	$A_{s,min} = 0.10N_{Ed}/f_{yd}$ or $0.002A_c$, whichever is greater	$A_{s,min} = 0.10N_{Ed}/f_{yd}$ or $0.004A_c$, whichever is greater
9.5.2 (3)	Maximum area of longitudinal reinforcement in columns	$A_{s,max} = 0.04A_c$ outside laps unless it can be shown that the integrity of the concrete will not be affected and that the full strength is achieved at the ULS. $A_{s,max} = 0.08A_c$ at laps	The longitudinal reinforcement should not exceed the following amounts, calculated as percentages of the gross cross-sectional area of the concrete: Vertically cast column = 6% ($A_{s,max} = 0.06A_c$) Horizontally cast column = 8% ($A_{s,max} = 0.08A_c$) Laps in vertically or horizontally cast columns = 10% ($A_{s,max} = 0.1A_c$)
9.5.3 (3)	Maximum spacing of transverse reinforcement in columns $s_{cl,tmax}$	$s_{cl,tmax}$ should take the least of the following three values: a) 20 times the minimum diameter of the longitudinal bars; b) the lesser dimension of the column; c) 400 mm.	Use the recommended value

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TABLE NA.1 — Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub-clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka decision
9.6.2 (1)	Minimum and maximum area of vertical reinforcement in walls	$A_{s,vmin} = 0.002A_c$ $A_{s,vmax} = 0.04A_c$ outside lap locations unless it can be shown that the integrity of the concrete is not affected and that the full strength is achieved at the ULS. This limit may be doubled at laps.	$A_{s,vmin} = 0.004A_c$ For $A_{s,vmax}$ use the recommended value
9.6.3 (1)	Minimum area of horizontal reinforcement in walls	$A_{s,hmin}$ = 25 % of the vertical reinforcement or $0.001A_c$, whichever is greater	Use the recommended value. Where the crack control is important early age thermal and shrinkage effects should be considered explicitly.
9.7 (1)	Minimum area of distribution reinforcement in deep beams	$A_{s,dbmin}$ = 0.1 % but not less than 150 mm^2/m in each face and in each direction	Use the recommended value
9.8.1 (3)	Value of $ø_{min}$ for pile caps	8 mm	10 mm
9.8.2.1 (1)	Value of $ø_{min}$ for columns and wall footings	8 mm	10 mm
9.8.3 (1)	Value of $ø_{min}$ for tie beams	8 mm	10 mm
9.8.3 (2)	Minimum downward load for tie beams	q_1 = 10 kN/m	To be determined for each individual project.
9.8.4 (1)	Values of q_2 and $ø_{min}$	q_2 = 5 Mpa $ø_{min}$ = 8 mm	Use the recommended values
9.8.5 (3)	Values of h_1 and $A_{s,bpmin}$	h_1 = 600 mm $A_{s,bpmin}$ from Table 9.6N	Use the recommended values. However for piles of Ac < 0.25 m^2 minimum diameters of longitudinal bars to be decided by the designer subject to the limit of 10 mm.
9.10.2.2 (2)	Force to be resisted by peripheral tie: values of q_1 and q_2	q_1= 10 kN/m q_2 = 70 kN	q_1= 10 kN/m q_2 = 70 kN

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TABLE NA.1 — Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub-clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka decision
9.10.2.3 (3)	Minimum tensile force that an internal tie is capable of resisting	$F_{tie,int}$ = 20 kN/m	$F_{tie,int} = [(q_k + g_k)/ 7.5](l_r/5)(F_t) \geq F_t$ kN/m Where $(q_k + g_k)$ is the sum of the average permanent and variable floor loads(kN/m^2); l_r is the greater of the distance (in m) between the centres of the columns, frames or the walls supporting any two adjacent floor spans in the direction of the tie under consideration; and $F_i = (20 + 4n_0) \leq 60$. Maximum spacing of internal ties = 1.5 l_r
9.10.2 .3 (4)	Internal ties on floors without screed: values of q3 and q4	q_3 = 20 kN q_4 = 70 kN	$F_{tie,int} = (1/7.5)(q_k + g_k)(l_r/5)(F_t) \geq F_t$ kN/m Where $(g_k + q_k)$ is the sum of the average permanent and variable floor loads in kN/m2. lr is the greater of the distance (in m) between the centres of the columns, frames or the walls supporting any two adjacent floor spans in the direction of the tie under consideration; and $F_t = (20 + 4n0) \leq 60$. Maximum spacing of internal ties = 1.5 l_r (q_3 and q_4 values are not given ,as they are in-built in to the formulae given here)
9.10.2.4 (2)	Force to be resisted by horizontal ties to external columns and/or walls provided at each floor level: values of $F_{tie,fac}$ and $F_{tie,col}$	$F_{tie,fac}$ = 20 kN per metre of the facade $F_{tie,col}$ = 150 kN	$F_{tie,fac}$ = 20 kN per metre of the façade. $F_{tie,col}$ = 3% of total vertical ultimate load carried by the column. Additionally , $F_{tie,col} \geq$ lesser of 2 Ft or $[(F_t l_s) /2.5]$ kN Where , l_s is the floor to ceiling height in metres; and F_t is the total design ultimate vertical load carried by the column or wall at that level.
11.3.5 (1)P	Value of α_{lcc} (light weight aggregate concrete)	0.85	Use the recommended value

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TABLE NA.1 — Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub-clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka decision
11.3.5 (2)P	Value of α_{lcc} (light weight aggregate concrete)	0.85	Use the recommended value
11.3.7 (1)	Value of k	k = 1.1 for lightweight aggregate concrete with sand as fine aggregate k = 1.0 for lightweight aggregate (both fine and coarse aggregate) concrete	Use the recommended value
11.6.1 (1)	Values of $C_{lRd,c}$, $\upsilon_{l,min}$ and k_1	$C_{lRd,c} = 0.15/\gamma_c$ $\upsilon_{l,min} = 0.30\ k^{3/2} f_{lck}^{1/2}$ $k = 0.15$	Use the recommended values
11.6.2 (1)	Values of v_1	$v_1 = 0.5\eta_1(1- f_{lck}/250)$	Use the recommended value
11.6.4.1(1)	Value of k_2	0.08	Use the recommended value
12.3.1 (1)	Values of $\alpha_{cc,pl}$ and $\alpha_{ct,pl}$ (plain concrete)	$\alpha_{cc,pl} = 0.8$ $\alpha_{ct,pl} = 0.8$	$\alpha_{cc,pl} = 0.6$ $\alpha_{ct,pl} = 0.6$
12.6.3 (2)	Values of k	1.5	Use the recommended value
A.2.1 (1)	Values of $\gamma_{s,red1}$	1.1	1.15
A.2.1 (2)	Values of $\gamma_{c,red1}$	1.4	1.5
A.2.2 (1)	Values of $\gamma_{s,red2}$ and $\gamma_{c,red2}$	$\gamma_{s,red2} = 1.05$ $\gamma_{c,red2} = 1.45$	$\gamma_{s,red2} = 1.15$ $\gamma_{c,red2} = 1.5$
A.2.2 (2)	Values of $\gamma_{c,red3}$	1.35	$\gamma_{c,red3} = 1.5$
A.2.3 (1)	Values of η and $\gamma_{c,red4}$	$\eta = 0.85$ $\gamma_{c,red4} = 1.3$	Use the recommended values
C.1 (1)	Value for fatigue stress range, minimum relative rib area and β	Table C.2N $\beta = 0.6$	Use the recommended values
C.1 (3) Note 1	Values of a for determination of f_{yk}, k, ε_{uk}	For f_{yk}, a = 10 MPa; k, a = 0, ε_{uk}, a = 0	Use the recommended values
C.1 (3) Note 2	Values of a for determination of f_{yk}, k, ε_{uk}	Minimum and maximum values for f_{yk}, k, ε_{uk} in accordance with Table C.3N	Use the recommended values

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TABLE NA.1 — Sri Lanka decisions for Nationally Determined Parameters described in SLS EN 1992-1-1:2012 (continued)

Sub-clause	Nationally Determined Parameter	Eurocode recommendation	Sri Lanka decision
E.1 (2)	Values of indicative strength classes	Table E.1N	Use the recommended Table E.1N
J.1 (2)	Value of $A_{s,surfmin}$	$0.01A_{ct,ext}$	Use the recommended value
J.2.2 (2)	Values of tanθ	$0.4 \leq \tan\theta \leq 1$	Use the recommended value
J.3 (2)	Value of k_1	0.25	Use the recommended value
J.3 (3)	Value of k_2	0.5	Use the recommended value

TABLE NA.2 – Recommended values of w_{max}

Exposure	Reinforced members and prestressed Members without bonded tendons (quasi-permanent load combination) mm	Presented members with bonded tendons (frequent load combination) mm
X0, XCl	0.3	0.2
XC2, XC3, XC4	0.3	0.2[a]
XD1, XD2, XD3, XS1, XS2, XS3		0.2 and decompression[b]
[a] For these exposure classes, in addition, decompression should be checked under the quasi-permanent combination of loads. [b] ω_{max} = 0.2 mm applies to parts of the member that do not have to be checked for decompression		

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TABLE NA.3 – Basic ratios of span/effective depth for reinforced concrete members without axial compression

Structural system	*K*	Concrete highly stressed ρ = 1.5 %	Concrete light stressed ρ = 0.5%
Simply supported beam, one-or two-way Spanning simply supported slab	1.0	14	20
End span of continuous beam or one-way Continuous slab or two-way spanning slab continuous over one long side	1.3	18	26
Interior span of beam or one-way or two-way spanning slab	1.5	20	30
Slab supported on columns without beams (flat slab) (based on longer span)	1.2	17	24
Cantilever	0.4	6	8

NOTE :

1. *The values given have been chosen to be generally conservative and calculation may frequently show that thinner members are possible.*
2. *For two-way spanning slabs, the check should be carried out on the basis of the shorter span. For flat slabs the longer span should be taken.*
3. *The limits given for flat slabs correspond to a less severe limitation than a mid-span deflection of span/250 relative to the columns. Experience has shown this to be satisfactory.*
4. *The values of k in the table may not be appropriate when the formwork is struck at an early age or when the construction loads exceed the design load. In these cases, the deflections may have to be calculated using advice in specialist literature, e.g the Concrete Society's report on deflections in concrete slabs and beams* [1] *and an article for the Magazine of Concrete Research entitled " Are existing span to depth rules conservative for flat slabs?"* [2]
5. *The ratio of area of reinforcement provided to that required should be limited to 1.5 when the span/depth ratio is adjusted. This limit also applies to any adjustments to span/depth ratio obtained from Expressions (7.16a) or (7.16b) from which this table has been derived for concrete class C30/37.*

1 — Deflections in concrete slabs and beams, Technical Report No.58, Concrete Society 2005.
2 —VOLLUM, R.L. and T.R. HOSSAIN, Are existing span t depth rules conservative for flat slabs?, Magazine of Concrete Research, vol. 54, issue 6, 2002.

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